

Atty. Docket No. 003587 USA D01/MASK/KT/OR
PATENT APPLICATION

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/851,779

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1 through 26 (Cancelled).

27. (Original) An apparatus for inspecting a multiple die reticle that is used with an optical exposure system under a set of exposure conditions, said multiple die reticle including at least a first die and a second die, said apparatus comprising:

a scanner for acquiring a plurality of aerial images of said multiple die reticle under said set of exposure conditions; said plurality of aerial images of said reticle comprising a first plurality of aerial images of said first die and a second plurality of aerial images of said second die; and

an image processing module for detecting variations in line width of said first die of said reticle using said first plurality of aerial images of said first die and said second plurality of aerial images of said second die of said multiple die reticle.

28. (Original) The apparatus according to claim 27, wherein said scanner comprises a plurality of cameras for acquiring said plurality of aerial images of said multiple die reticle.

29. (Original) The apparatus according to claim 28, wherein said plurality of cameras comprises:

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a first camera for acquiring a first image of said plurality of aerial images of said multiple die reticle;

a second camera for acquiring a second image of said plurality of aerial images of said multiple die reticle; and

a third camera for acquiring a third image of said plurality of aerial images of said multiple die reticle.

30. (Original) The apparatus according to claim 29, wherein:

said first camera is in focus;

said second camera is out of focus in a positive direction; and

said third camera is out of focus in a negative direction.

31. (Original) The apparatus according to claim 28, wherein:

said scanner further comprises a light source for illuminating said reticle with an illuminating light; and

said plurality of cameras are sensitive to said illuminating light.

32. (Original) The apparatus according to claim 31, wherein said light source is a pulsating light source.

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33. (Original) The apparatus according to claim 32, wherein said pulsating light source is a pulsating laser.

34. (Currently amended) The apparatus according to claim 26 27, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

35. (Original) The apparatus according to claim 32, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

36. (Currently amended) The apparatus according to claim 26 29, wherein said scanner further comprises:

a transmission light illumination system for illuminating said reticle;

a dark field illumination system for illuminating said reticle; and

an optical system for collecting light emerging from said reticle and creating aerial images of said reticle in said first, said second, and said third cameras.

37. (Original) The apparatus according to claim 36, wherein said optical system of said scanner further comprises a numerical aperture diaphragm for reproducing said set of exposure conditions.

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38. (Original) The apparatus according to claim 36, wherein said dark field illumination system is positioned adjacent to said optical system.

39. (Original) The apparatus according to claim 36, wherein said dark field illumination system is coaxial with said optical system.

40. (Original) The apparatus according to claim 36, wherein said dark field illumination system and said transmission light illumination system are positioned on opposite sides of said reticle.

41. (Original) An apparatus for inspecting a reticle that is used with an optical exposure system under a set of exposure conditions, said apparatus comprising:

a scanner for acquiring a first plurality of aerial images of said reticle in a transmitted light under said set of exposure conditions and a second plurality of aerial images of said reticle in a reflected light; and

an image processing module for detecting defects in said reticle using said first plurality of aerial images of said reticle and said second plurality of aerial images of said reticle.

42. (Original) The apparatus according to claim 41, wherein said scanner further comprises:

a transmission light illumination system for illuminating a first face of said reticle;

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a dark field illumination system for illuminating a second face of said reticle; and
an optical system for collecting light emerging from said reticle and acquiring said first
and said second pluralities of aerial images of said reticle.

43. (Original) An apparatus for inspecting a multiple die reticle that is used with an
optical exposure system under a set of exposure conditions, said multiple die reticle including at
least a first die and a second die, said apparatus comprising:

a light source;

transmission light illumination means for illuminating said reticle;

optical means for producing a plurality of magnified aerial images of said reticle under
said set of exposure conditions, said optical means having a numerical aperture diaphragm for
reproducing said set of exposure conditions;

imaging means for acquiring said plurality of magnified aerial images of said reticle; said
plurality of magnified aerial images of said reticle comprising a first plurality of aerial images of
said first die and a second plurality of aerial images of said second die; and

image processing means for analyzing a condition of said reticle using said first plurality
of aerial images of said first die and said second plurality of aerial images of said second die.

44. (Original) The apparatus according to claim 43, wherein said light source is a
pulsating light source.

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45. (Original) The apparatus according to claim 44, wherein said pulsating light source is a pulsating laser.

46. (Original) The apparatus according to claim 43, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

47. (Original) The apparatus according to claim 44, further comprising a stage on which said reticle is placed, and means for moving said stage in a continuous manner.

48. (Original) The apparatus according to claim 43, further comprising a dark field illumination means for illuminating said reticle.

49. (Original) The apparatus according to claim 43, wherein said transmission light illumination means and said dark field illumination means are positioned on opposite sides of said reticle.

50. (Original) The apparatus according to claim 43, wherein said imaging means further comprises a plurality of cameras for acquiring said plurality of magnified aerial images of said reticle when the reticle is illuminated by said transmission light illumination means.

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51. (Original) The apparatus according to claim 50, wherein said plurality of cameras comprises:

a first camera for acquiring a first image of said plurality of magnified aerial images of said reticle;

a second camera for acquiring a second image of said plurality of magnified aerial images of said reticle; and

a third camera for acquiring a third image of said plurality of magnified aerial images of said reticle; said first, said second and said third aerial images of said reticle being respectively acquired by said first, said second and said third cameras when the reticle is illuminated by said transmission light illumination means.

52. (Original) The apparatus according to claim 51, wherein:

said first camera is in focus;

said second camera is out of focus in a positive direction; and

said third camera is out of focus in a negative direction.

53. (Original) The apparatus according to claim 52, wherein:

said first camera acquires a fourth image of said plurality of magnified aerial images of said reticle, said fourth image being acquired when said reticle is illuminated by said dark field illumination system.

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54. (Original) The apparatus according to claim 53, wherein said image processing means uses said fourth image to identify defects in said reticle.

55. (Original) The apparatus according to claim 43, further comprising a post process and review means for displaying said condition of said reticle in a graphical form.

56. (Original) The apparatus according to claim 51, wherein:

a wavelength of the light source is identical to the wavelength of the exposure system;

and

said first, said second, and said third cameras are sensitive to said spectrum of said laser light source.

57. (Original) The apparatus according to claim 43, further comprising a homogenizer disposed in the vicinity of said transmission light illumination means for reducing speckle resulting from use of said light source;

Claims 58 through 63 (Cancelled).